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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 851,210	05/07/2001	Steven J. Harrington	D/98258	3224

7590 09/22/2006

Patent Documentation Center
Xerox Corporation
Xerox Square 20th Floor
100 Clinton Ave. S.
Rochester, NY 14644

EXAMINER	
THOMPSON, JAMES A	

ART UNIT	PAPER NUMBER
2625	

DATE MAILED: 09/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/851,210	HARRINGTON, STEVEN J.	
	Examiner	Art Unit	
	James A. Thompson	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 07 July 2006 have been fully considered but they are not persuasive.

Regarding page 6, line 2 to page 7, line 24: None of the present claims recite an ink or any kind of article of manufacture. Claims 1-16 recite *methods* for *utilizing* different color inks in a printing system. These methods involve performing operations on a color space *defined* by YMCK inks. In other words, claims 1-16 are methods which perform operations on *data (the color space) about ink*. Data about ink is not ink itself anymore than, say, a detailed listing of attributes of an automobile is the automobile itself, or the information about someone listed on a driver's license is itself an actual living, breathing human being.

Furthermore, tessellating a color space does fall within the judicially created exceptions since the mathematical manipulation of a color space is simply an abstract idea, namely the application of an algorithmic formula, and would thus pre-empt every substantial practical application of the abstract idea (see Benson, 409 U.S. at 71-72, 175 USPQ at 676; cf, Diehr, 450 U.S. at 187,209 USPQ at 8).

In response to Applicant's request that Examiner identify the features of the invention that would render the claimed subject matter statutory, Examiner respectfully suggests that some form of physical transformation or operation would be needed to make the claims statutory. The claims as presently recited only perform internal algorithmic operations, and do not cause any form of physical transformation which produces a

concrete, tangible and useful result. Some form of concrete, tangible and useful result would be required before the claims could be considered statutory, such as the halftoning and printing of image data on a physical hardcopy using a YMCK ink printing system as discussed on page 4, lines 20-26 of the present specification.

Regarding page 7, line 28 to page 8, line 12: Firstly, while black may not often be *referred* to as a redundant color, in the context of a YMCK color space black *is* a redundant color as the term is technically defined. A redundant color ink is an ink that is not essential to reproducing the available color space. When there is a redundant color ink, there is more than one physical way to produce the same logical color. In a YMCK ink set, Yellow (Y), Magenta (M), and Cyan (C), are sufficient to reproduce the full gamut of colors. Black (K) is not necessary, but the use of black provides for multiple ways in which each logical color can be reproduced. Black is commonly used along with Yellow, Magenta and Cyan since under-color removal can be implemented. This has the advantage of requiring less ink in a particular area of a medium, and using less expensive ink since black ink tends to be cheaper than color inks. Thus, while black ink is commonly and ubiquitously linked with YMC inks, it is still a redundant color ink as the term is understood in the art.

Secondly, Hirokazu (US Patent Application Publication 2001/0028471 A1) does in fact tessellate the color space into regions. One common way in which a region of an overall space can be specified is by specifying the points by which the region is bounded. The discrete points set out in figure 2 of Hirokazu define the regions of an overall color space since the color

space is broken up into regions of a specific size defined by a point (L*,a,b) and a size in each dimension (ΔL*,Δa,Δb). The patches printed on the 2-dimensional medium shown in figure 2 of Hirokazu show that an overall color space, which is a rectangular solid with a midpoint at (L*,a,b) and which extends ±2ΔL* along the L*-axis, ±2Δa along the a-axis, and ±2Δb along the b-axis, is tessellated into smaller regions of size ΔL* along the L*-axis, Δa along the a-axis, and Δb along the b-axis (or, volume of tessellated region equals [ΔL]*x[Δa]x[Δb]). While the manner in which the tessellation is *expressed* may be different than that in the present specification, the color space is still tessellated into regions as required by the present claims.

Regarding page 8, lines 13-17: Since claims 1 and 8 have been demonstrated to be allowable, and none of the other claims upon which claims 6 and 16 depend from have been specifically argued for patentability, claims 6 and 16 cannot be deemed allowable solely based on their dependencies.

Conclusion: Applicant's amendments to the present claims have been fully considered and are addressed in the prior art rejections set forth in detail below. The new grounds of rejection set forth below have been necessitated by the present amendments to the claims.

2. Applicant's arguments, see page 7, lines 25-27, filed 07 July 2006, with respect to the rejection of claims 1-7 under 35 USC §112, 2nd paragraph have been fully considered and are persuasive. The rejection of claims 1-7 under 35 USC §112, 2nd paragraph listed in items 5-6 of the previous office action, mailed 31 March 2006, has been withdrawn.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1 and 8 each recite tessellating an available color space as defined by redundant color inks into regions, along with particular details about said tessellation.

A color space is simply a multi-dimensional mathematical representation of the colors that are available for a color image reproduction device. Tessellating said color space is simply partitioning the said multi-dimensional mathematical representation into a plurality of regions. Thus, claims 1 and 8 merely recite the manipulation of a data structure, which is non-statutory. The methods recited in claims 1 and 8 do not therefore produce a useful, concrete and tangible result.

Furthermore, claims 1 and 8 are directed to an abstract idea, namely that of tessellating an available color space to minimize luminance variation, and thus pre-empts any other possible ways in which a color space may be tessellated so as to minimize luminance variation in the redundant color inks utilized that have not been disclosed in the present specification, but may be discovered in the future (see Benson, 409 U.S. at 71-72, 175 USPQ at 676; cf, Diehr, 450 U.S. at 187,209 USPQ at 8).

For the above reasons, claims 1 and 8, along with claims 2-7 and claims 9-12 which respectively depend from claims 1 and 8, are non-statutory.

5. Claims 13-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 13 recites a method of tessellating, sorting and connecting YMCK and additional color inks in an available color space. A color space is simply a multi-dimensional mathematical representation of the colors that are available for a color image reproduction device. Tessellating said color space is simply partitioning the said multi-dimensional mathematical representation into a plurality of regions. The steps of sorting and connecting the redundant color inks in the color space are simply manipulations of the thus partitioned color space regions. Thus, claim 13 merely recites the manipulation of a data structure, which is non-statutory. The method recited in claim 13 does not therefore produce a useful, concrete and tangible result. Claim 13, along with claims 14-16 which depend from claim 13, are therefore non-statutory.

Furthermore, claim 13 is directed to an abstract idea, namely that of a mathematical algorithm for manipulating color space data, and thus pre-empts any other possible practical application of said abstract idea (see Benson, 409 U.S. at 71-72, 175 USPQ at 676; cf, Diehr, 450 U.S. at 187,209 USPQ at 8).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 3 and 5-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point

out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "redundant color inks" in line 4. There is insufficient antecedent basis for this limitation in the claim.

8. Claims 9-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 9 recites the limitation "redundant color inks" in line 5. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 1-5 and 7-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirokazu (US Patent Application Publication 2001/0028471 A1) in view of Gondek (US Patent 5,982,990).

Regarding claim 1: Hirokazu discloses tessellating an available color space (figure 2 and para. 43 of Hirokazu) as defined by YMCK inks (para. 21, lines 1-5 of Hirokazu), by using

vertices representing points associated with each YMCK ink (figure 2; para. 22; and para. 43 of Hirokazu - L*a*b* points each directly represent a corresponding point in the YMCK ink color space), to divide the available color space into regions (figure 2(61,62,63,64,65) of Hirokazu) where the regions are arranged so as to minimize the range of luminance variation found within the regions (para. 42, lines 7-12 and para. 44, lines 1-7 of Hirokazu). The available color space is partitioned (and thus tessellated) into regions (figure 2(61,62,63,64,65) of Hirokazu) based on lightness (L*) and color (a* and b*) values (figure 2 and para. 43 of Hirokazu), which are derived directly from YMCK inks (para. 21, lines 1-5 of Hirokazu). Since the partitioned regions are arranged based on constant values of L* (and thus a variation of zero) (para. 42, lines 7-12 and para. 44, lines 1-7 of Hirokazu), the regions are therefore arranged so as to minimize the range of luminance variation found within the regions. Furthermore, black ink in the set of YMCK inks is a redundant color inks since, as is well known in the art, yellow, magenta and cyan (YMC) are of themselves sufficient to fully specify the color space. As also well-known in the art, black (K) is redundantly used in color ink printing so that a minimum amount of ink is placed on the print medium, and since black ink is cheaper than color ink.

Hirokazu does not disclose expressly that said available color space is further defined by at least one additional color ink, and that said vertices represent each YMCK and the at least one additional ink.

Gondek discloses defining a color space that has at least one additional color ink apart from the standard color inks, and vertices in the color space represent each YMCK and the at least

one additional ink (figure 1(20(L_cL_m)); column 3, lines 45-50; and column 4, lines 58-60 of Gondek).

Hirokazu is analogous art since it is from the same field of endeavor as the present application, namely the tessellation and organization of a color space in a digital color image data reproduction system (figure 2 and figure 4 of Hirokazu). Hirokazu and Gondek are combinable because they are from the same field of endeavor, namely the control and processing of color ink spaces with redundant color inks for digital image data processing and printing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include additional color inks in the overall multi-dimensional color space, as taught by Gondek. The motivation for doing so would have been that the use of more redundant ink colors improves the resultant output of the printed hardcopy (column 2, lines 25-39 of Gondek). Therefore, it would have been obvious to combine Gondek with Hirokazu to obtain the invention as specified in claim 1.

Regarding claim 2: Hirokazu discloses overlaying the tessellated color space result from the prior tessellating step with interpolation points so as to create an overlay lookup table (para. 28, lines 7-12 of Hirokazu).

Regarding claim 3: Hirokazu discloses applying image data to the overlay lookup table to point to which additional color inks to select (para. 35 of Hirokazu) and provide the amounts to use of the selected redundant color inks (para. 34 of Hirokazu).

Regarding claim 4: Hirokazu discloses that the regions are arranged so that region boundaries are predominantly orthogonal to the axis of luminance (figure 2 and para. 42, lines 8-12 of Hirokazu). Since the regions are arranged purely with respect

to increasing L* values (figure 2 and para. 42, lines 8-12 of Hirokazu), then the region boundaries are orthogonal to the axis of luminance.

Regarding claim 5: Hirokazu discloses that the amounts are interpolated from the interpolation points stored in the overlay lookup table (para. 28, lines 7-12 of Hirokazu).

Regarding claim 7: Hirokazu discloses that the regions are non-overlapping (figure 2 and para. 42, lines 8-12 of Hirokazu). Since the regions are each at separate, constant values of L* (figure 2 and para. 42, lines 8-12 of Hirokazu), the regions cannot overlap.

Regarding claim 8: Hirokazu discloses tessellating into regions the given resultant color space (figure 2 and para. 43 of Hirokazu) so as to minimize luminance variation (para. 42, lines 7-12 and para. 44, lines 1-7 of Hirokazu) in the regions as defined by the YMCK color inks utilized (para. 21, lines 1-5 of Hirokazu). The color space is partitioned (and thus tessellated) into regions (figure 2(61,62,63,64,65) of Hirokazu) based on lightness (L*) and color (a* and b*) values (figure 2 and para. 43 of Hirokazu), which are derived from YMCK color inks (para. 21, lines 1-5 of Hirokazu). Since the partitioned regions are arranged based on constant values of L* (and thus a variation of zero) (para. 42, lines 7-12 and para. 44, lines 1-7 of Hirokazu), the regions are therefore arranged so as to minimize the luminance variation found within the regions. Furthermore, YMCK is a set of redundant color inks since, as is well known in the art, cyan, magenta and yellow (CMY) are of themselves sufficient to fully specify the color space. As is well-known in the art, black (K) is redundantly used in color ink

printing so that a minimum amount of ink is placed on the print medium, and since black ink is cheaper than color ink.

Hirokazu does not disclose expressly that the resultant color space and the tessellated regions are defined by YMCK and additional color inks.

Gondek discloses defining a color space that has at least one additional color ink apart from the standard (YMCK) color inks, and defining regions that have at least one additional color ink apart from the standard (YMCK) color inks (figure 1(20 (L_cL_m)); column 3, lines 45-50; and column 4, lines 58-60 of Gondek).

Hirokazu is analogous art since it is from the same field of endeavor as the present application, namely the tessellation and organization of a color space in a digital color image data reproduction system (figure 2 and figure 4 of Hirokazu). Hirokazu and Gondek are combinable because they are from the same field of endeavor, namely the control and processing of color ink spaces with redundant color inks for digital image data processing and printing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include additional color inks in the overall multi-dimensional color spaces and regions, as taught by Gondek. The motivation for doing so would have been that the use of more redundant ink colors improves the resultant output of the printed hardcopy (column 2, lines 25-39 of Gondek). Therefore, it would have been obvious to combine Gondek with Hirokazu to obtain the invention as specified in claim 8.

Regarding claim 9: Hirokazu discloses sorting the YMCK color inks by order of luminance from the darkest to the lightest (figure 2 and para. 42, lines 8-12 of Hirokazu). From

right to left, the redundant color inks, which are converted into CIELab color space (para. 37-38 of Hirokazu), are sorted in order of luminance from the darkest ($L^* - 2\Delta L$) to the lightest ($L^* + 2\Delta L$) (figure 2 and para. 42, lines 8-12 of Hirokazu).

By combination with Gondek, as set forth in the arguments regarding claim 8, the set of color inks is the YMCK and additional color inks.

Regarding claim 10: Hirokazu discloses that the regions are non-overlapping (figure 2 and para. 42, lines 8-12 of Hirokazu). Since the regions are each at separate, constant values of L* (figure 2 and para. 42, lines 8-12 of Hirokazu), the regions cannot overlap.

Regarding claim 11: Hirokazu discloses overlaying the tessellated color space with interpolation points so as to create an overlay lookup table (para. 28, lines 7-12 of Hirokazu).

Regarding claim 12: Hirokazu discloses applying image data to the overlay lookup table to point to which redundant color inks to select (para. 35 of Hirokazu) and provide the amounts to use of the selected redundant color inks (para. 34 of Hirokazu).

Regarding claim 13: Hirokazu discloses tessellating the given resultant color space into regions (figure 2 and para. 43 of Hirokazu) so as to minimize luminance variation (para. 42, lines 7-12 and para. 44, lines 1-7 of Hirokazu) in the regions (para. 21, lines 1-5 of Hirokazu), the regions delineated by vertices representing points associated with each YMCK ink (figure 2; para. 22; and para. 43 of Hirokazu - L*a*b* points each directly represent a corresponding point in the YMCK ink color space). The color space is partitioned (and thus tessellated) into regions (figure 2(61,62,63,64,65) of Hirokazu) based

on lightness (L*) and color (a* and b*) values (figure 2 and para. 43 of Hirokazu), which are derived from redundant color inks (CMYK) (para. 21, lines 1-5 of Hirokazu). Since the partitioned regions are arranged based on constant values of L* (and thus a variation of zero) (para. 42, lines 7-12 and para. 44, lines 1-7 of Hirokazu), the regions are therefore arranged so as to minimize the luminance variation found within the regions. Furthermore, YMCK is a set of redundant color inks since, as is well known in the art, yellow, magenta and cyan (YMC) are of themselves sufficient to fully specify the color space. As also is well-known in the art, black (K) is redundantly used in color ink printing so that a minimum amount of ink is placed on the print medium, and since black ink is cheaper than color ink.

Hirokazu further discloses that said tessellating is performed by sorting delineated vertices as defined by each YMCK ink by order of luminance from the darkest to the lightest (figure 2 and para. 42, lines 8-12 of Hirokazu). From right to left, the redundant color inks, which are converted into CIELab color space (para. 37-38 of Hirokazu), are sorted in order of luminance from the darkest ($L^* - 2\Delta L$) to the lightest ($L^* + 2\Delta L$) (figure 2 and para. 42, lines 8-12 of Hirokazu).

Hirokazu further discloses connecting the delineated vertices as defined by YMCK inks in the sorted order across the color space so as to create tetrahedral non-overlapping tessellated regions (figure 2 and para. 42, lines 8-12 of Hirokazu) with borders which are as much as possible predominantly orthogonal to the axis of luminance (figure 2 and para. 42, lines 8-12 of Hirokazu). The regions are defined by a constant L* value, a range of a* values, and a range of b* values, which form a four-

sided region (such as figure 2(61) of Hirokazu), and thus a tetrahedron. Since the tetrahedral regions are each at separate, constant values of L* (figure 2 and para. 42, lines 8-12 of Hirokazu), the tetrahedral regions cannot overlap. Furthermore, since the regions are arranged purely with respect to increasing L* values (figure 2 and para. 42, lines 8-12 of Hirokazu), then the region boundaries are orthogonal to the axis of luminance.

Hirokazu does not disclose expressly that said available color space is further defined by at least one additional color ink, and that said vertices represent and are defined by each YMCK and the at least one additional ink.

Gondek discloses defining a color space that has at least one additional color ink apart from the standard color inks, and vertices in the color space represent and are defined by each YMCK and the at least one additional ink (figure 1(20(L_cL_m)); column 3, lines 45-50; and column 4, lines 58-60 of Gondek).

Hirokazu is analogous art since it is from the same field of endeavor as the present application, namely the tessellation and organization of a color space in a digital color image data reproduction system (figure 2 and figure 4 of Hirokazu). Hirokazu and Gondek are combinable because they are from the same field of endeavor, namely the control and processing of color ink spaces with redundant color inks for digital image data processing and printing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include additional color inks in the overall multi-dimensional color space, as taught by Gondek. The motivation for doing so would have been that the use of more redundant ink colors improves the resultant output of the printed hardcopy (column 2, lines 25-39 of Gondek). Therefore, it would have been obvious

to combine Gondek with Hirokazu to obtain the invention as specified in claim 13.

Regarding claim 14: Hirokazu discloses overlaying the tessellated color space with interpolation points so as to create an overlay lookup table (para. 28, lines 7-12 of Hirokazu).

Regarding claim 15: Hirokazu discloses applying image data to the overlay lookup table to point to which redundant color inks to select (para. 35 of Hirokazu) and provide the amounts to use of the selected redundant color inks (para. 34 of Hirokazu).

11. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirokazu (US Patent Application Publication 2001/0028471 A1) in view of Gondek (US Patent 5,982,990) and Ng (US Patent 5,185,661).

Regarding claim 6: Hirokazu in view of Gondek does not disclose expressly that the interpolation is performed by calculating the volume of tetrahedra formed by the interpolation points.

Ng discloses that interpolation is performed by calculating the volume of tetrahedra formed by the interpolation points (figure 4 and column 5, lines 16-24 of Ng).

Hirokazu in view of Gondek is combinable with Ng because they are from the same field of endeavor, namely color mapping and conversion of digital image data. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to perform interpolation by specifically calculating the volume of tetrahedra formed by the interpolation points, as taught by Ng. The suggestion for doing so would have been such interpolation based on the eight surrounding points

and the associated volume is well-known (column 5, lines 19-22 of Ng), and thus readily applied and accurate. Therefore, it would have been obvious to combine Ng with Hirokazu in view of Gondek to obtain the invention as specified in claim 6.

12. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hirokazu (US Patent Application Publication 2001/0028471 A1) in view of Gondek (US Patent 5,982,990) and Kasson (US Patent 5,390,035).

Regarding claim 16: Hirokazu discloses compensating for the convexity or concavity of the tessellated regions (para. 35 of Hirokazu).

Hirokazu in view of Gondek does not disclose expressly that, if creating a tetrahedral non-overlapping tessellated region results in a concave shape, then additional tetrahedral non-overlapping tessellated regions are added to fill the cavity and maintain a convex construction.

Kasson discloses that, if creating a tetrahedral non-overlapping tessellated region results in a concave shape, then additional tetrahedral non-overlapping tessellated regions are added to fill the cavity and maintain a convex construction (figure 7 and column 14, lines 3-9 of Kasson). The tetrahedra are generated using a volume packing technique which minimizes distortion of the domain space (column 14, lines 3-6 of Kasson). Figure 7 of Kasson shows that an overall convex shape is maintained for the domain space. Further, since the domain space is packed with octahedra that are in turn packed with tetrahedra (column 14, lines 6-9 of Kasson), then a convex shape will inherently be maintained owing to the convex shape of an octahedron.

Hirokazu in view of Gondek is combinable with Kasson because they are from the same field of endeavor, namely the tessellation and organization of a color space in a digital color image data reproduction system. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to include additional tetrahedral non-overlapping tessellated regions to maintain a convex construction, as taught by Kasson. The motivation for doing so would have been minimize the distortion of the domain space (column 14, lines 3-6 of Kasson). Therefore, it would have been obvious to combine Kasson with Hirokazu in view of Gondek to obtain the invention as specified in claim 16.

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Thompson whose telephone number is 571-272-7441. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

James A. Thompson
Examiner
Technology Division 2625

07 September 2006

DAVID MOORE
SUPERVISORY PATENT EXAMINER
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